



Human-Centered Cockpit Information & Flight Path Management Concepts for Flight Path Management

The Cockpit Situation Display (CSD) integrates weather, terrain, and flight-traffic situational awareness into a 4-D visualization, with the vehicle's flight management system; and provides tools that, integrated with the vehicle's flight management system, allow graphical flight path replanning and hazard avoidance. The CSD, suitably extended, would provide operators and pilots of spacecraft and landers with the ability to manage 4-D vehicle trajectories for docking and landing activities.

Objective

The Flight Deck Display Research Laboratory (FDDRL) develops both prototypes and guidelines for advanced interfaces which integrate displays, decision support tools, and flight deck automation. A primary goal of the FDDRL is to provide human-centered solutions and concepts which address projected changes in roles and responsibilities on future flight decks. Chief among these are real-time flight replanning which takes into account constraints, such as required times of arrival, as well as surrounding traffic, weather, and terrain.

Approach

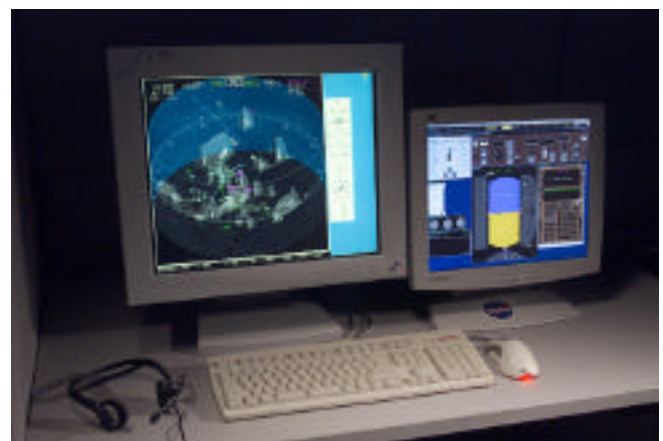
Low-, medium- and high-fidelity simulations are used to develop guidelines and test concepts. Low-fidelity simulations include traditional part-task research studies of specific interface design features and concepts, while mid- and high-fidelity simulations are used to test more integrated interface principles and concepts.

Impact

This research application has provided an enabling technology for the proposed evolution of the National Airspace System. These interface technologies are currently being employed to allow testing of multiple new airspace management concepts.

Relevance to Exploration Systems

The FDDRL conducts research and development for advanced human-centered displays and controls that support the management of 4-D flight paths. This work is directly relevant to the design of spacecraft displays and controls where the operator must monitor and adjust 4-D



landing or docking trajectories, and the incorporation of re-entering space vehicles into the National Air Space System.

H&RT Program Elements:

This research capability supports the following H&RT program elements:

ASTP: Advanced Studies, Concepts and Tools;
Software, Intelligent Systems & Modeling

TMP: Advanced Space Operations

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